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ABSTRACT

The definition of educational technology has shifted from a focus on the organization and use of hardware and software items as a delivery system to recognizing that the introduction of technology into educational systems demands a systematic approach to enhance learning and human development. In the first definition, curriculum is the transmission of subject matter, while in the second it is a means to enable people from different backgrounds to reach their human potential. Enhancing human performance is not a simple, straightforward process. Growth steps can be categorized into four major stages of intellectual development: dualistic, multiplistic, relativistic, and commitment. The first two stages reflect the first definition, but the second definition must be implemented if students are to progress through stages 3 and 4. Distance education presents a particular challenge if students are to be participative, interactive, and critical inquirers with a sense of confidence and responsibility, because most distance education emphasizes one-way communication through different forms of media. However, through a systematic approach to designing and developing the program, an appropriate balance of media and tutors can be arranged to achieve interaction and two-way communication with students. Six references are listed. (LMM)

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EDUCATIONAL TECHNOLOGY TO ENHANCE LEARNING AT A DISTANCE - A SYSTEMATIC APPROACH

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The evolution and emergence of the field of Educational Technology can be seen in the two definitions offered in the U.S. by the Commission on Instructional Technology in their report "To Improve Learning".

> "In its more familiar sense it means the media born of the communications revolution which can be used for instructional purposes alongside the teacher, textbook and blackboard...the pieces that make up instructional technology: television, films, overhead projectors, computers and other items of 'hardware and 'software'".
>
> The second definition recognizes the metamorphosis which was taking place - it goes beyond any particular medium or device and depicts instructional technology as more than the sum of its parts." Instructional technology is a systematic way of designing, carrying out, and evaluating the total process of learning and teaching in terms of specific objectives, based on research in human learning and communication and employing a combination of human and non-human resources to bring about more effective instruction."

These definitions demonstrate that there has been a significant conceptual shift in the field. We have moved in our thinking from seeing educational

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technology as the organization and use of items of hardware and software as a delivery system to recognizing that the introduction of technology into our educational systems demands a systematic approach to enhance learning and human development.

Typically, those who still adhere to the first definition see the curriculum as the transmission of subject matter, teaching as telling, and learning as the acquisition of subject matter or information. In this one-way communication, authority-centered system information acquisition is seen as an end in itself.

The second definition sees the curriculum as a means to enable people from different backgrounds reach their human potential. With enhancing human learning and performance as the starting place, objectives and strategies for reaching them are developed. The strategies must be of an integrated nature involving interactive communication where feedback and modification are continual. Evaluation is carried out on both the strategies and the learning outcomes.

Enhancing human performance is not a simple straightforward process. This is, in part, due to the fact that the individual learners are all different, and have different interests, backgrounds, skills and expectations. During this century many stage theorists such as Dewey, Piaget, Bloom and Gagné have given us guidelines for developing the curriculum to help students learn from the simple to the complex, from low level intellectual skills to a higher level.

William Perry, a Harvard psychologist, identified nine growth steps which can be grouped into four major stages of intellectual development - the dualistic, multiplistic, relativistic and commitment stages. Teaching styles which parallel the student growth stages are shown in the following sequence.

Student	Teacher
1. Dualism	
Wants the answer	Teaching is telling
Knowledge equals facts	One-way communication
Avoids ambiguity	Questions and answers
Authorities have answers	Subject matter acquisition is basic
Memorize by hard work	Tests on recall
2. Multiplicity	
Wants more answers	Teaching is telling plus media
Ambiquity grudgingly acknowledged	One-way communication - some ambiguity
Everyone has right to own opinion	Cites multiple authorities
Permissive regarding diversity	Student expected to be active learner
No one is wrong	Evaluation on recall and applications
3. Relativism	
Context determines inquiry	Teaching includes group and individual work
Ambiguity is fact of life	Needs assessment - alternative methods
Knowledge is constructed	Different authorities - ambiguity accepted
Reasonable people can disagree	Two-way communication for mastery
Knowledge is qualitative	Evaluate recall applications, implications
4. Commitment	
Contextual relativism assumed	Courses based on readiness levels
Open to alternatives	Critical inquiry encouraged
An ongoing, unfolding activity	Creativity supported
Decisions based on reasoning	Collaborative problem solving
Explores issues responsibly	Evaluation based on mastery criteria

The stages of teaching depicted also reflect the two definitions for educational technology. The first definition, when implemented, can help students reach stages 1 and 2. Implementation of the second definition is needed if we are to help students grow through stages 3 and 4 where learner-centered activities and two-way interactive communication are important.

Distance education presents a particular challenge if students are to be participative, interactive, and critical inquirers with a sense of confidence and responsibility. Educational technology presents an opportunity if we adhere to the second definition.

The challenge is because most distance education involves a considerable amount of one-way communication through different forms of the media as, for example, television, radio and printed materials. The opportunity is because through a systematic approach to designing and developing the program, an appropriate balance of media and tutors can be arranged so that interaction and two-way communication with students can be achieved.

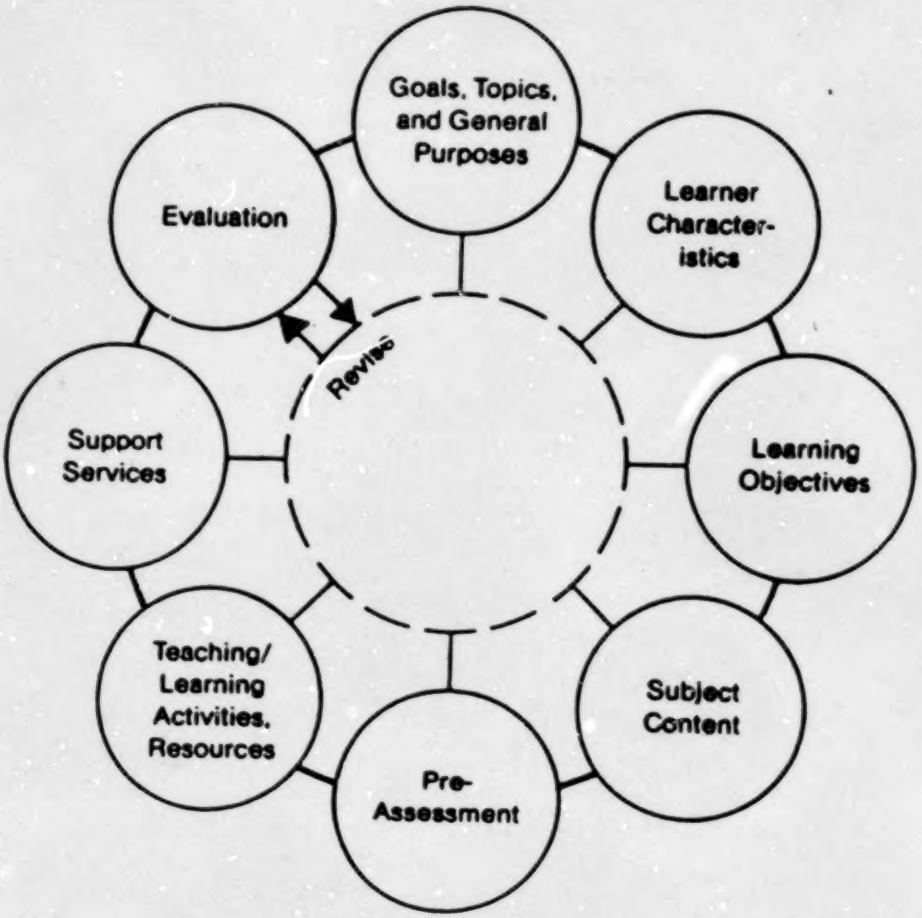
Tutors are essential, but they need the appropriate skills. For example, they will not help students to grow towards stages 3 and 4 if they are dogmatic, looking for pat answers, dependent upon authority figures and needing to dominate the learner. They will help the students to grow if they can listen, interact positively, assess the learner's readiness level, guide students towards mastery, help with their critical inquiry, reinforce interdependence and evaluate in both a formative and summative manner.

How can this be done? Through a variety of ways, including face-to-face interactions, advisory meetings, correspondence, telephone calls, radio talks, cassette commentaries, and group meetings.

The tutors can help with a wide range of activities, in addition to helping students clarify their concepts, develop principles and use them in problem solving. Tutors can also help students to develop study skills such as note taking, reading and listening; to manage their time, organize material, write papers, take tests, control their learning, master the units of curriculum, set priorities and develop new learning objectives.

A systematic approach to curriculum design involves developing and preparing tutors, as well as presentations and study assignments.

One model which is widely used for instructional development was created by Jerry Kemp.



Using such a model helps us to raise the right questions and is a means to an end in the same way that subject matter and educational technology are means to an end - the enhancing of student learning and human performance.

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